

Posthumous Publication of New Dipterocarp Species from North Borneo

Footnote:—These notes are put together from material supplied by the Forest Department of North Borneo and the Forest Research Institute of the Federation of Malaya, and are now published to validate the new species, descriptions of which the authors had left in manuscript.

Editor.

1. *Dipterocarpus exalatus* van Slooten sp.nov. (§ Angulati).

A *D. kunstleri*, cui simillima, ramulis magis applanatis, internodiis virgularum glabris, foliis adultis angustioribus, fructibus validius angulatis, laciniis accrescentibus perbrevioribus vel carentibus haec species sat distincta.

Arbor elata circa 40 m. alta, cum trunco 90 cm. in diam. *Folia* chartacea vel coriacea, lanceolata, interdum elliptico- vel oblongo-lanceolata, apice abrupte caudato-acuminata, basin versus cuneata, margine crenato-sinuata, 12–22 cm. longa, 5.5–9 cm. lata, costis nervisque subtus minute lepidotis exceptis utrinque glabra, nervis lateralibus utrinsecus 15–20 praedita, petiolis 2–3 cm. longis stipitata. *Inflorescentia* in ramulis producta, axillaris vel apicalis, solitaria, ad 22 cm. usque longa, in ramulos sympodiales 4–8 floribus praeditos 1–3-plo divisa. *Flores* alternati, vel fere secundi; calyx infundibuliformis, coriaceus vel ligneus, in pedicellum 10–15 mm. longum attenuatus, prominenter 5-angulatus, apice in lobos duos majores ad 10 mm. usque longos et in tres alteros fere dimidiis divisus; petala oblique spathulata, basi connata, in alabastro torta et extus minute stellato tomentosa. *Fructus* valde 5-angulatus, 4–5 cm. longus, 2.3–3.5 cm. in diam. glaber, cum laciniis 2 reductis vel interdum accrescentibus ad 12 cm. usque longis, ad 3 cm. usque latis, alteris 3 excrescentibus auriculatis. *Nux* ovoideus, 4 cm. longus, 2 cm. in diam., superne pubescens, in stylopodium exsertum, angulato-costatum, paullatim attenuatus.

BORNEO: Parte orientale indonesiana, apud Balikpapan (bb. 13,913, holotypus in BO). Parte septentrionale britannica, Sandakan, (SAN 1721, paratypi in SAN & BO).

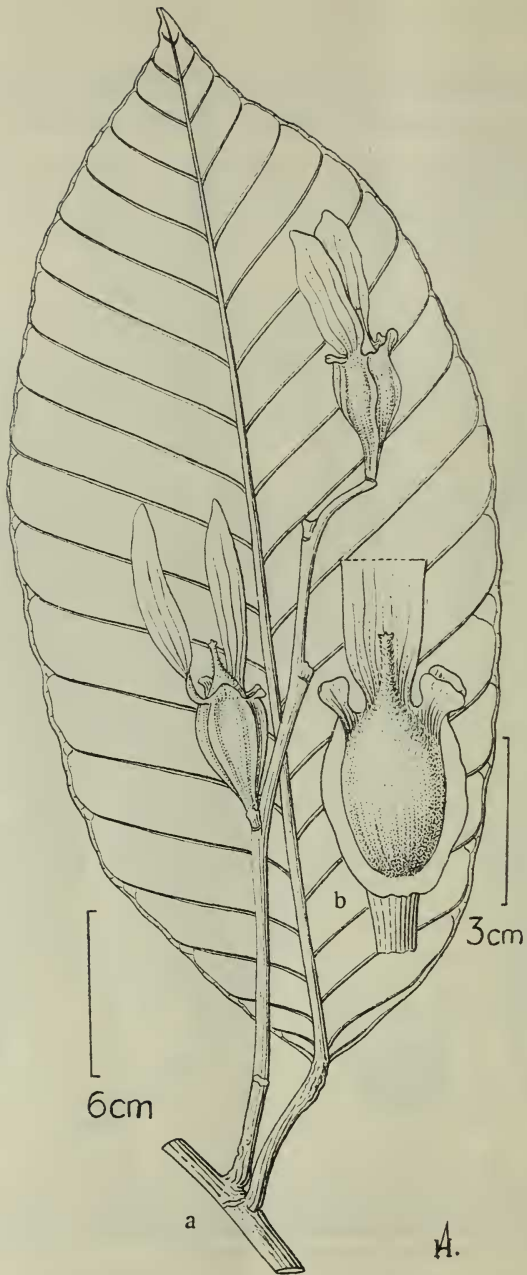
This species is very like *D. kunstleri* but differs from that in more flattened twigs, glabrous internodes of the young shoots, narrower leaves, more prominently-angled fruits, much shorter accrescent lobes of the fruit.

[The name has been used before as a *nomen nudum*. The drawings with notes were prepared by Dr. van Slooten.]



Diptercarpus exalatus v. Sl. (bb. 13,913, holotypus)

- a, Ramulus floriferus. b, Alabastrum ante anthesin. c, Flos post anthesin.
 d, Ibid. apertus ut stamina ovariumque appareant. e, Calyx longitudinaliter
 dissectus ut ovarium appareat. f, Stamina.



Diptercarpus exalatus v. *Sl.* (SAN 1721: paratypus)
a. Ramulus fructiferus. b, Fructus juvenilis cum calyce dissecto.

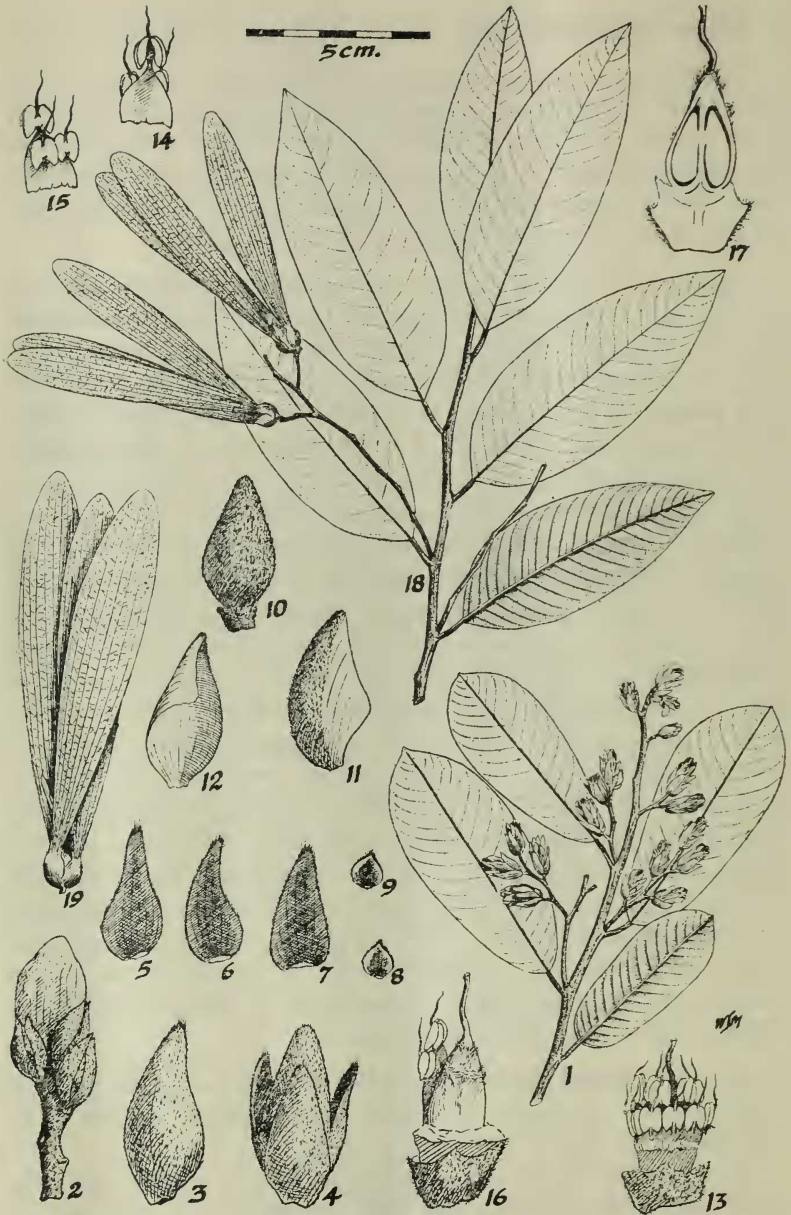
2. *Shorea argentifolia* Sym. sp.nov. (§ Grex "Red Meranti")

Ponenda inter species staminibus 15 biseriatim dispositis; antheris quadriloculatis ad anthesin interdum reflexis; appendiculis haud ciliatis, interdum reflexis in serie interiore quam anthera plerumque brevioribus. *S. leprosulae* Miq. similis, sed foliis minoribus, nervis eorum lateralibus pluribus, floribus conspicue pedicellatis, stylis brevioribus haec species sat dissimilis.

Arbor elata, circa 50 m. alta, cum ramulis apice applanatis, griseis, stellato-tomentosis, et gemmis latentibus fulvo-tomentosis. *Stipula* conspicua, oblongo-elliptica, acuta, 1–2 cm. longa, circa 9-nervia, extus tomentosa, intus lepidoto-puberula, diu persistens, dein decidua. *Folia* oblonga vel obovato-oblonga, interdum elliptico-oblonga, 5–9 cm. longa, 2–4 cm. lata, basi abrupte cuneata vel rotundiuscula, apice attenuata, acuta vel subito acuminata, supra glabra, subtus dense tomento-stellata fulvo- vel argenteo-brunnea, utrinsecus 20–25—nervia, petiolis 0.75–1.25 cm. longis eodemmodo stellato-tomentosis stipitata. *Inflorescentia* paniculata, ad 14 cm. usque longa, eodemmodo tomentosa, in ramulis secundariis flores 4–8 congestos producta, cum bracteis bracteolisque pubescentibus, diu persistentibus dein deciduis. *Flores* ante anthesin 3.5 mm. longi, breviter pedicellati, extus argenteo-tomentosi; sepala majora 3, ovato-oblonga, extus tomentosa, intus glabra, altera 2 multo minora, ovata, extus partim tomentosa; petala albescentia, in parte ante anthesin exposita tomentosa excepta, glabra; stamina 15 biseriatim disposita, 5 interiora exterioribus 10 fere duplo altiora, basi dilatata. *Fructus* 5-angulatus, luteo-brunneus; calycis lobi stellato-puberuli, concavi, cum laciniis accrescentibus 3, obovato-lanceolatis, 8–11 cm. longis, 1–2 cm. latis, laciniis alteris 2 excrescentibus, linearibus, 0.8–1.5 cm. longis, ad 2 mm. usque latis. *Nux* ovoideus, in stylopodium conicum attenuatus, minute tomentosus 0.75–1.5 cm. altus.

BORNEO: **Brunei**, Batu Apoi (KEP 39,617, paratypus in KEP; KEP 40,471, paratypus in KEP). **North Borneo**: Tawau (KEP 38,838=SAN 4462, holotypus in KEP).

This tall tree has a bole with regular fissures with brown outer bark and purple brown inner one. The leaves are very narrow. The tomentum which varies in colour from grey or silvery grey to yellowish brown is found on the underside of the leaves, branchlets, inflorescence axis, bracts and the flower parts exposed in the buds. Similar to *S. leprosula* Miq., but leaves smaller having more



Shorea argentifolia Sym. (fig. 1-17; KEP 38,838; fig. 18; KEP 39,617; fig. 19: KEP 40,471)

- 1, Ramulus floriferus. 2, Paniculæ fragmentum. 3, Bractea. 4, Alabastrum. 5-9, Sepala. 10, Alabastrum sepalis remotis. 11 & 12, Petala. 13, Flos sepalis desumptis. 14 & 15, Stamina. 16, Flos sepalis, petalis staminibus remotis ut pistillum appareat. 17, Ovarium longitudinaliter discissum. 18, Ramulus fructiferus. 19, Fructus (Amussis cum fig. 1, 18 et 19 tantum congruens; alteræ figuræ ampliatae).

lateral nerves, flowers more distinctly pedicelled and style shorter. It belongs to the *S. parvifolia* group of the Red Meranti (cf. Symington, Malay For. Rec. 16, 1943, p. 4 & 58-59).

[The drawing was made by Mr. Wong Sze Moy under the direction of Symington whose notes have been also incorporated here. The name has been used in literature as a *nomen nudum* even in A. L. Howard's "A Manual of the Timbers of the World" (1948)].

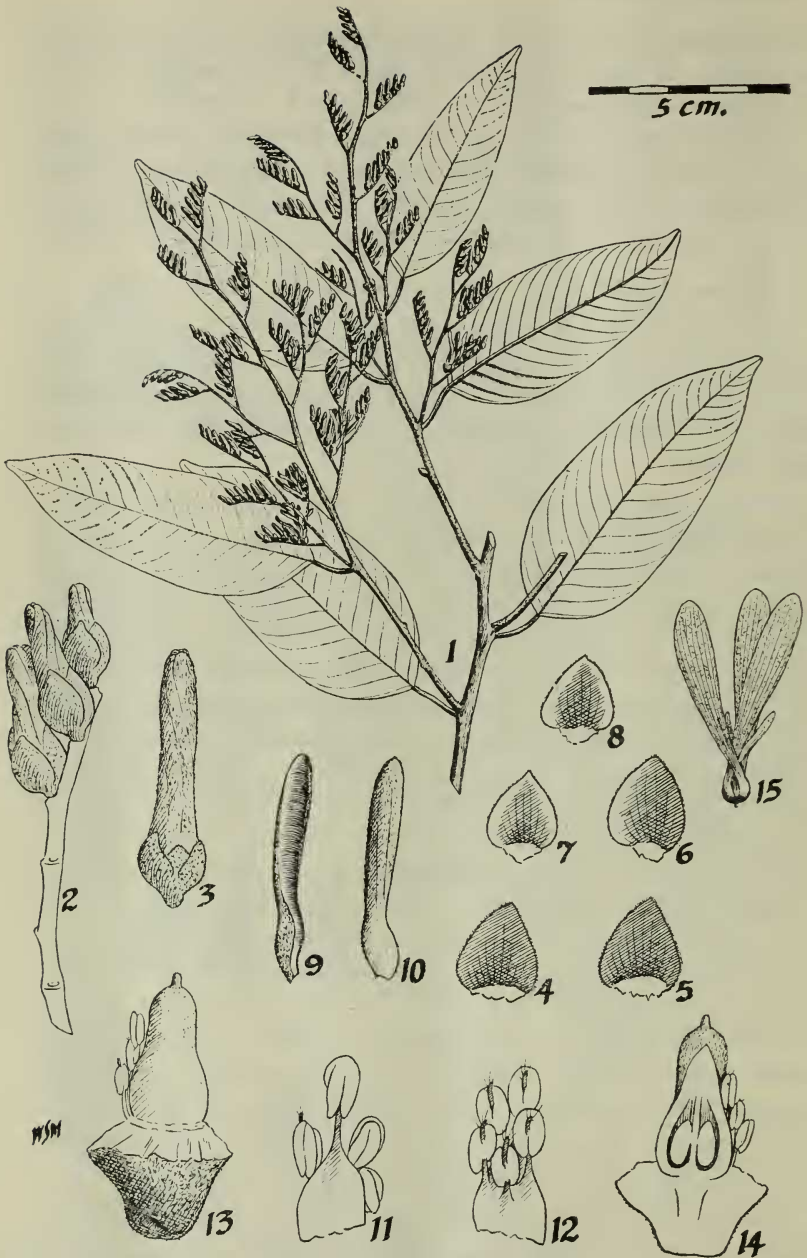
3. *Shorea superba* Sym. sp.nov. (§ *Eushorea* subsect. *ciliata*)

Inter omnes hujus subsectionis species truncis fere levigatis griseis, basi longitudinaliter paulo-tabularibus; foliis multinervatis, supra griseo rubris, subtus brunneis vel argenteo-griseis, fructibus parvis cum laciniis 3 majoribus et 2 multo minoribus haec species sat distincta.

Arbor elata, circa 60-75 m. alta, cum ramulis apice brunneis, minute stellato-tomentosis. *Stipula* ovato elliptica, mox decidua, roseo-viridis, 1-1.5 cm. longa, 4-5 mm. lata, eodemmodo stellata. *Folia* oblongo-lanceolata, 5-9 cm. longa, 2-3 cm. lata, acuminata vel caudato-acuminata, basi cuneata vel rotundata, supra costis deciduo-tomentosis exceptis glabra, nitida, brunnea, subtus minute stellato-tomentosa, vetustiore fere glabra glaucescentia, utrinsecus 15-25 nervia. *Inflorescentia* in ramulis apicem versus oriens, terminalis axillarisque, axi stellato-tomentosa, in ramulos primarios vel secundarios floriferos divisa, bracteolis deciduis, multinerviis tomentosis praedita. *Flores* per ramulum floriferum 2-8, ante anthesin 2-4 mm. longi, pedicellis brevissimis circa 1 mm. longis suffulti; sepala 3 majora quam altera 2, omnia ovata, apice acuta vel fere, tomentosa; petala linearia, undulata, in alabastro torta. puberula, extus grisea, intus brunnea; stamina 28-32 altitudine variabilia, in appendiculas apice 1-5 ciliatas terminata. *Fructus* breviter stipitatus, laciniis puberulis praeditus, 3 accrescentibus spathuloideis 5-6 cm. longis 1.25 cm. latis, alteris 2, minoribus, angustioribus, linearibus, apice acutis vel obtusis, 3 cm. longis, 3-4 mm. latis. *Nux* ovoideus, sericeo-tomentosus, in stylopodium abrupte angustatus, ad 1.2 cm. longus, 0.75 cm. in diam.

BORNEO: North Borneo: Sandakan: Bettotan (KEP 38,853= Puasa SAN 4,477, holotypus in KEP, isotypi in SAN & SING): Tawao (Elmer 21,714, paratypus in SING).

This species produces relatively smooth, grey bole with irregularly scaling or cracked bark, small buttresses, many nerved



Shorea superba Sym. (fig. 1-14: Holotypus; fig. 15: Elmer 21,714)
 1, Ramulus floriferus. 2, Paniculae fragmentum. 3, Alabastrum. 4-8, Sepala.
 9-10, Petala. 11-12, Stamina. 13, Flos sepalis, petalis staminibusque
 desumptis ut pistillum appareat. 14, Ovarium longitudinaliter discissum.
 15, Fructus. (Amussis cum fig. 1 et 15 congruens; alterae fig. ampliatae).

leaves which are shining brown above and pale fawn or silvery grey with minute stellate hairs below, silky tomentose flowers and small fruits with minutely pubescent wings.

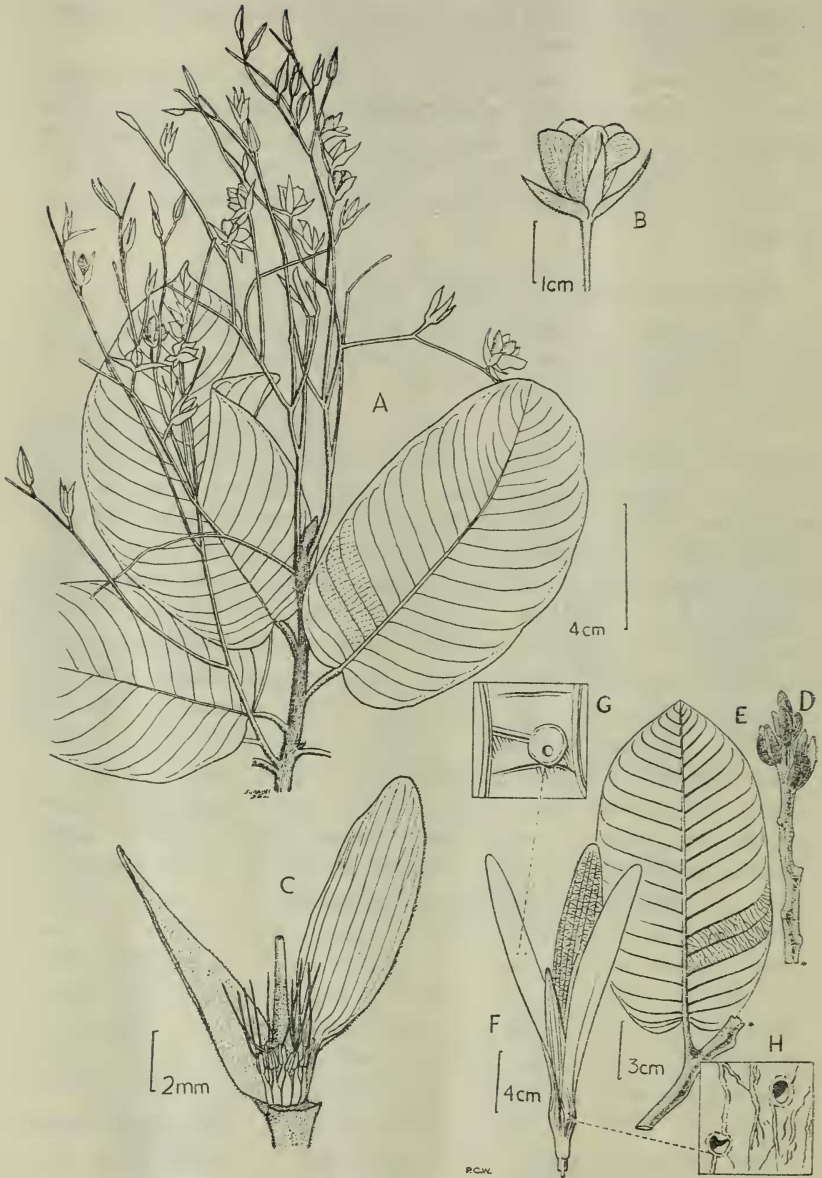
[The drawing was made by Mr. Wong Sze Moy under the direction of Symington, whose notes have been incorporated here. The species has been listed as *Shorea* sp. 'B' (not to be confused with Symington's *Shorea* sp. "B" of *Malayan Forest Records*, No. 16, 1943, p. 95) in the herbarium of the Forest Research Institute, Kepong.]

4. *Shorea symingtonii* Wood sp. nov. (§ Anthoshorea)

A *S. virescente* Parijs, cui affinis haec species differt nervis foliorum lateralibus pluribus, petalis latoribus, fructibus basi valde attenuatis, laciniis eorum longioribus.

Arbor elata, circa 60 m. alta, cum ramulis juventute applanatis, dense fulvo-tomentosis, dein fuscentibus parce tomentosis. *Stipula* 1–1.5 cm. longa, 2–5 mm. lata, tomentosa decidua. *Folia* oblonga vel oblanceolata, 12–16 cm. longa 6–7 cm. lata, obtuso-apiculata vel acuminata, interdum bullatula, basi rotundata vel saepe cordulata, utrinque fulva vel brunnea, supra glabra, subtus secus costas et nervos parce puberula, margine revoluta, utrinsecus 16–24 nervia, petiolis 2 cm. longis, brunneis, minute stellato-tomentosis suffulta. *Inflorescentia* terminalis vel etiam in parte ramuli infra-terminale axillaris, circa 20 cm. longa, laxe multiramosa, deciduo bracteata, florum bracteolis deciduis, puberulis. *Flores* remoti, ante anthesin oblongi vel lanceolati 10–13 mm. longi, 3–4 mm. in diam., pubescentes, fusci, pedicellis ad 5 mm. usque altis, apicem versus crassioribus, concoloribus, pubescentibus suffulti; sepala linearis-lanceolata, coriacea, margine incrassata, leviter cymbiformia, utrinque fusco-pubescentia, inaequalia, tria alteris duobus maiora, omnia conformia; petala oblonga, apice obtusa vel truncata multinervosa, chartacea, in partibus alabastri expositis albotomentosa; stamina 15, per series duas disposita, interiora 5 altiora quam exteriora 10. *Fructus* 5-laciniatus, basi valde angustatus, pedicello 2–3 mm. longo suffultus, interdum glandulosus, laciniis 3 longioribus linearis-oblongis, apice sensim arcuato-acutis, 12–17 cm. longis, 1.6–2 cm. latis; alteris laciniis 2, linearibus, apicem versus angustatis, acutis, 8–10 cm. longis 7–10 mm. latis. *Nux* ovoideus, 2–2.5 cm. longus, minute pubescente rugosus.

BORNEO: North Borneo: Sandakan, Sepilok (KEP 35,608—SAN 16,522, holotypus in SAN, isotypi in KEP, SING et al; SAN 15481, paratypus in SAN, isoparatypi in KEP, SING, etc.).



Shorea symingtonii Wood (A-C: KEP 35,608; D-H: SAN 15481)

A, Ramulus floriferus. B, Flos. C, Ibid. petalis partim remotis ut dispositio staminum appareat. D, Surculus cum bracteolis. E, Folium. F, Fructus. G & H, Glandula ampliata.

This large tree with shallow fissured and large buttressed bole, has large leaves 12–16 cm. long, 6–7 cm. wide, often cordulate at base, having 16–24 pairs of lateral nerves, the midrib and lateral veins being minutely hairy below; the fruit 5-winged (3 large and 2 shorter ones) narrowed at base, shortly pedicelled. It is an ally of *S. virescens* Parijs, but has more lateral nerves to the leaves, flowers more apart, petals wider, fruits strongly attenuate at base and bearing longer lobes.

[The drawing with fruit was prepared by Miss P. W. Wood at Kew, the one with flowers has been made from the isotype specimen in Singapore by the Singapore artist.]

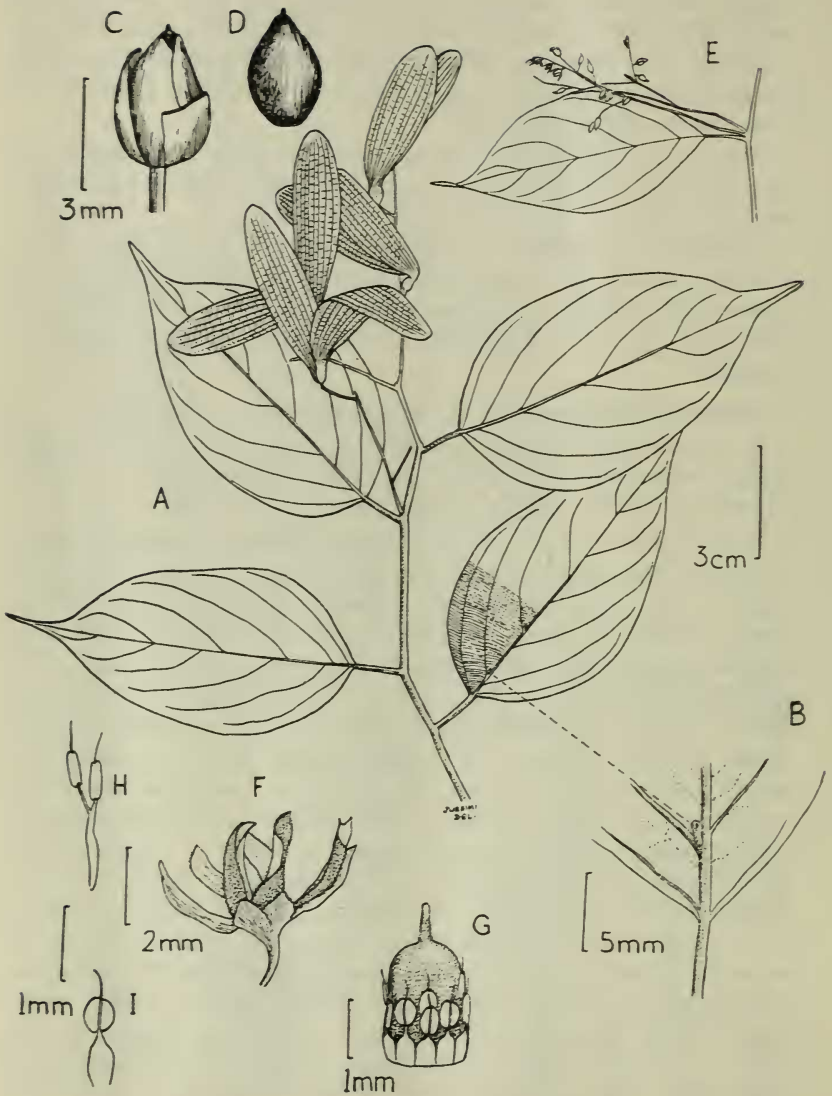
Originally this species was separated as new by Symington but was not named. Some specimens have been distributed as *S. symingtoniana* which is a pre-occupied name. It has been listed as *Shorea* sp. 'L' in the herbarium of the Forest Research Institute, Kepong.

5. *Hopea pentanervia* Sym. ex Wood sp. nov. (§ Euhopea)

H. nutanti Ridl. similis, sed foliis minoribus glabrisque, nervis eorum lateralibus paucioribus utrinsecus plerumque 5, floribus minoribus, laciniis fructus angustioribus sat dissimilis.

Arbor circa 30 m. alta. *Folia* ovata vel elliptica, olivaceo-viridia, 6–9.5 cm. longa, 2.5–5 cm. lata, caudato-acuminata, basi paulo oblique rotundata vel breviter cuneata, utrinque glabra, supra nitida, utrinsecus nervis lateralibus 4–7 plerumque 5, porrectis subtus prominenter, supra dibilter percursa, petiolis circa 1–1.3 cm. longis stipitata. *Inflorescentia* axillaris, solitaria vel interdum binaria, in ramos secundarios floriferos ad 1.5 cm. usque longos divisa, bracteis deciduis, axi omnino glabra. *Flores* in alabastro ovoidei, cum pedicellis 4 mm. altis circa 2 cm. longi; sepala utrinque glabra, 2 majora petalis paulo longiora, lingulata, externe longitudinaliter reflexa, olivaceo-brunnea, altera 3 minora ovata vel fere orbicularia, albescentia, margine fimbriata; petala linearia, apicem versus paulo angustata, obtusa, margine fimbriata, extus albo-tomentosa, intus fere glabra vel minute puberula, flavescentia; stamina 15, per series 2 disposita, inaequalia. *Fructus* bi-laciniatus, omnino glaber, fusco-brunneus, pedicello 1.5–2 mm. longo stipitatus; laciniis majoribus 2 spathulatis, 4.5–5.5 cm. longis, 1 cm. latis; minoribus 3, circa 5 mm. longis, quam nux cum stylopodio brevioribus. *Nux* ovato-conicalis, breviter apiculatus, 6 mm. longus, 2.5 mm. in diam.

BORNEO: Sarawak, Baram (SAR 1257, holotypus in KEP, isoholotypus in SAR). North Borneo, Bongawan—Paper (Mail, SAN A. 1753, paratypus in SAN, isoparatypus in KEP & SING).



Hopea pentanervia Wood (A-D: A-1753 in SING; E-I: SAR 1257 in KEP)

A, Ramulus fructiferus. B, Folii fragmentum cum glandula (ampliatum).
C, Fructus. D, Nux. E, Ramulus floriferus. F, Flos. G, Ovarium cum staminibus. H & I: Stamina.

The leaves are glabrous, provided usually with 5 pairs of nerves and often with domatid glands in the axils of basal nerves. Bole often fluted, somewhat cracked and flaking. The species is similar to *H. nutans* Ridl., but differs in smaller glabrous leaves having fewer lateral nerves, smaller flowers, and in the fruit wings being narrow.

[The drawing is made by the artist of the Botanic Gardens, Singapore, from the specimens in Kepong Herbarium.]